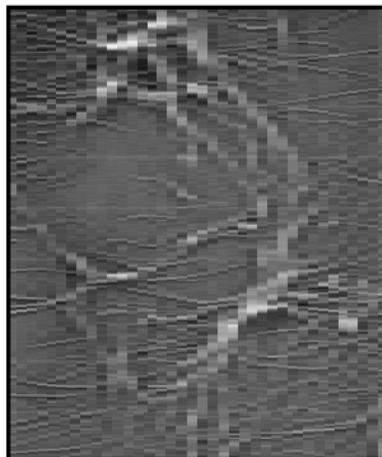
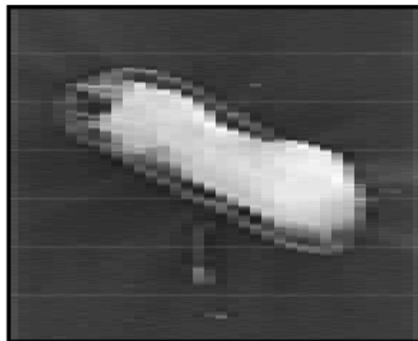
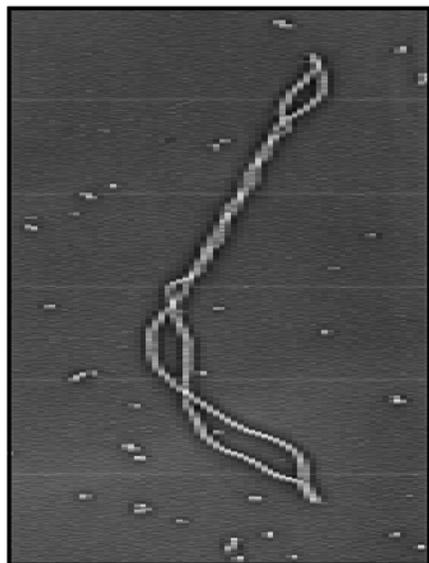


## Streamlined TEM Sample Preparation for the Life Sciences

Vitua is a unique thin film deposition system specially configured for TEM sample preparation



Images Courtesy Professor Jack Griffith, Lineberger Comprehensive Cancer Center, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina.

### Organic Molecule Imaging Using TEM

TEM organic molecule imaging presents unique challenges. Small samples, such as DNA or complex proteins, are exceptionally difficult to image using traditional staining techniques. Moreover, stained samples are often damaged or altered by the electron beam.

### The Vitua Solution

Denton Vacuum's Vitua<sup>®</sup> system resolves many of the problems with traditional organic molecule imaging by enabling successful, consistent high resolution rotary shadow casting.

The major barrier to using high resolution rotary shadow casting on organic molecules has been the need to deposit thin, consistent metal layers onto the sample specimen. This requires equipment modification and significant user expertise and experience.

The Vitua system reliably and accurately deposits an extremely thin tungsten contrast layer removing the need to stain the sample. After the tungsten deposition, Vitua can be programmed to deposit a layer of carbon to provide structural strength and integrity to the sample.

Vitua includes proven processes that eliminate the guesswork and trial and error associated with high resolution rotary shadow casting. Vitua automates a complicated process, removing a steep learning curve and ensuring successful results that are consistent and repeatable.

Designed, built and supported by Denton Vacuum, the world leader in thin film microscopy sample preparation, Vitua streamlines TEM sample preparation and opens up this technique for wider use in organic molecule imaging.



## Process Overview and System Specifications

### Rotary Shadow Casting Sample Preparation

The Denton Vacuum Vitua® system provides a fully characterized, automated process to deposit an extremely thin contrast layer of tungsten followed by a carbon structural-support layer.

Tungsten deposition is via thermal evaporation of a tungsten wire that is positioned vertically in the process chamber. The specimen sample stage is mounted horizontally. Deposited thin films range in thickness from 1 to 3 nm.

The user may also program Vitua for automatic carbon deposition. This process is via thermal evaporation of a carbon rod that has been specially sized to provide a thin, consistent layer.

The Vitua system can be programmed to automatically deposit tungsten and carbon in sequence, ensuring consistent and repeatable thin film layers. Users can utilize process parameters recommended by Denton, or program time, power and other parameters to meet their unique requirements.

### Vitua System Configuration

12-inch Bell jar with automatic lift

Turbo Molecular Pump, 250 lps  
nXDS10i Edwards Dry Scroll Pump, 6.7 cfm  
LN2 Trap Assembly

Inficon SQM-160 Deposition Monitor (optional)

2 kVa low voltage power supply  
AC Glow with Gas (optional)  
Crystal sensor

2-inch (50 mm) rotating substrate stage

### Color Touch Screen Control System

An intuitive, easy-to-use touch screen interface automates operation, displays real time system information/status, and provides software safety interlocks to protect equipment/user

CE Compliant

### Utility Requirements

#### Electrical

Standard with 208V, 1Ø, 3 wire, 50/60 Hz

#### Air

Normal dry shop air, 80-110 psi (5.5-7.5 Bar) for system valve operation

#### Nitrogen (optional)

Preferentially evaporated from a liquid source, and 5-15 psi (0.3-1 Bar) for chamber venting

### Vitua Footprint (approximate)

#### Height:

70-82" (178-208 cm) high with glass jar up

#### Width:

37" (94 cm) Wide [with LN2 trap]

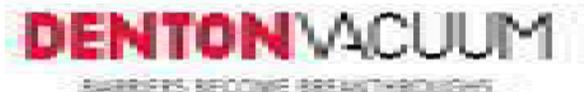
#### Depth:

44" (112 cm) Deep

#### Weight:

800 pounds (363 Kg)

Specifications subject to change. Consult Denton Vacuum for updated information.



1259 North Church Street  
Moorestown, NJ 00850 USA  
[www.dentonvacuum.com](http://www.dentonvacuum.com)

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